

REMARKS

In the present Amendment, claim 1 has been amended to correct a typographical error. Claim 51 has been amended to depend solely on claim 1. No new matter has been added, and entry of the Amendment is respectfully requested.

Claims 1 and 5-53 are pending, of which claims 20-50 are withdrawn from consideration.

Claims 51-53 are objected to as being in improper form because a multiple dependent claim cannot depend from any other multiple dependent claim.

As noted, claim 51 has been amended to depend solely on claim 1. Accordingly, withdrawal of the objection to claims 51-53 is requested.

Claims 1, 6 and 8-19 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Kiuchi et al (WO 01/42360 or US 6,730,402 or US 2003/0152776, equivalent documents).

Claim 5 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Kiuchi et al in view of Nakamura et al (US 6,645,630).

Claim 7 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Kiuchi et al in view of Takada et al (JP 2002-241590).

Applicants submit that the above three rejections should be withdrawn because Kiuchi et al, Nakamura et al and Takada et al do not disclose or render obvious the present invention, either alone or in combination.

Present claim 1 relates to an epoxy resin composition including a phenol resin (F) and an epoxy compound (G),

wherein the phenol resin (F) has a specific structure represented by one of general formulas (3) to (8), and contains at least one of the structural units X and Y represented by general formulas (1) and (2), respectively,

the number (n or $m+m'$) of repetition of the structural unit X or Y is $10 < (n \text{ or } m+m') < 75$,

the epoxy compound (G) has a specific structure represented by one of general formulas (11) to (16), and contains at least one of the structural units X' and Y' represented by general formulas (9) and (10), respectively,

the number (n or $m+m'$) of repetition of the structural unit X' or Y' is $0 \leq (n \text{ or } m+m') \leq 10$.

Herein, the presently claimed phenol resin (F) has a high molecular weight because the number (n or $m+m'$) of repetition of the structural unit X or Y is $10 < n \text{ or } m+m' < 75$, while the presently claimed epoxy compound (G) has a low molecular weight because the number (n or $m+m'$) of repetition of the structural unit X' or Y' is $0 \leq (n \text{ or } m+m') \leq 10$.

According to the present invention, superior effects of improving heat resistance and adhesion can be obtained by the combination of a high molecular weight phenol resin and a low molecular weight epoxy resin (page 7, lines 12-16 of the specification).

Specifically, as shown in Table 4 at page 56 of the specification, both Examples 1 and 2 according to the present invention include a low molecular weight epoxy resin and a high molecular weight phenol resin, while both Comparative Examples 1 and 2 include a low molecular weight epoxy resin and a low molecular weight phenol resin.

Comparing Examples 1 and 2 with Comparative Examples 1 and 2, each of the Examples 1 and 2 has a glass transition temperature, T_g , which shows an index of heat-resistance, higher than that of Comparative Examples 1 and 2. In addition, each of Examples 1 and 2 has superior adhesion to copper foil as compared with Comparative Examples 1 and 2.

Kiuchi et al teaches an epoxy resin composition includes an epoxy resin “(A)” and an epoxy resin curing agent “(B)”, the epoxy resin curing agent “(B)” includes a phenol resin “(F).”

However, both of the phenol resin “(F)” and the epoxy resin “(A)” in Kiuchi et al has a low molecular weight, such as 300 to 10,000 (US 6,730,402, col. 14, lines 58-62) in which each of the numbers of repetition (n) of the phenol resin “(F)” and the epoxy resin “(A)” is $0 \leq n \leq 10$.

Accordingly, Kiuchi et al does not teach or suggest the combination of a low molecular weight epoxy resin and a high molecular weight phenol resin, as required by the present claims.

Nakamura et al discloses an epoxy resin composition. However, Nakamura et al does not teach or suggest the combination of the low molecular weight epoxy resin and the high molecular weight phenol resin, as required by the present claims.

Takada et al discloses an epoxy resin composition having non-combustibility, which includes (A) an epoxy resin having at least two epoxy groups in a molecule; (B) a phenol group curing agent; (C) a phenoxy resin; and (D) an inorganic filler (abstract).

In Takade et al, the phenoxy resin is different from the phenol resin in substances.

Although it is disclosed, in Takada et al, that the phenol group curing agent includes phenol resin, it is silent as to whether the phenol resin has a low molecular weight or a high molecular weight.

Accordingly, Takada et al does not teach or suggest the combination of the low molecular weight epoxy resin and the high molecular weight phenol resin, as required by the present claims.

In view of the above, the present claims are not obvious and are patentable over Kiuchi et al, Nakamura et al, and Takada et al, either alone or in combination. Reconsideration and withdrawal of all the §103(a) rejections are respectfully requested.

Claims 1, 6 and 8-19 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over the combined limitations of claims 27-29, 36-39, 58-66 and 69 of Kiuchi et al (US 6,730,402).

Claim 5 is rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over Kiuchi et al in view of Nakamura et al.

Claim 7 is rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over Kiuchi et al in view of Takada et al.

Applicants submit that the above three double patenting rejections should be withdrawn because the present claims are not obvious over the claims of Kiuchi et al.

As discussed above with respect to the § 103 rejections, Kiuchi et al does not teach or suggest the combination of the low molecular weight epoxy resin and the high molecular weight phenol resin, as required by the present claims. Of course, the claims of Kiuchi et al do not have such a recitation.

Accordingly, the present claims are not obvious and are patentable over the claims of Kiuchi et al.

Nakamura et al and Takada et al do not make up for the deficiencies of Kiuchi et al.

In view of the above, reconsideration and withdrawal of the double patenting rejections are respectfully requested.

Allowance is respectfully requested. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

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Respectfully submitted,

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